SOLAR OBSERVATION

SOLAR AND SKY RADIATION MEASUREMENTS DURING SEPTEMBER, 1924

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For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements, the reader is referred to the REVIEW for January and February, 1924, **52**:42 and 113.

From Table 1 it is seen that solar radiation intensities averaged above normal at all three stations.

Table 2 shows that the total solar and sky radiation received on a horizontal surface averaged below normal at the three stations for which normals have been determined.

Skylight polarization measurements made on 5 days at Washington give a mean of 50 per cent, with a maximum of 52 per cent on the 6th. Measurements obtained on 12 days at Madison give a mean of 68 per cent, with a maximum of 71 per cent on the 5th and 30th. The values for Washington are slightly below, and those for Madison approximate closely the averages for September for the respective stations.

TABLE 1.—*Solar radiation intensities during September, 1924*

[Gram-calories per minute per square centimeter of normal surface]

Washington, D. C.

Date	Sun's zenith distance										
	Sa.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass									Local mean solar time
		A. M.					P. M.				
	e	5.0	4.0	3.0	2.0	[1]1.0	2.0	3.0	4.0	5.0	e
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Sept. 2	18.59				0.87						19.23
4	9.14	0.73	0.86	1.00	1.17	1.38					8.48
6	6.76	0.78	0.95	1.09	1.21						5.79
10	6.27	0.89	1.00	1.12	1.31						5.79
11	7.04				1.22	1.40					6.02
18	10.21				0.84						9.83
23	7.87	0.86	0.95	1.06	1.28	1.55	1.27	1.04	0.93	0.80	7.87
24	6.50	0.92	1.03	1.16	1.30	1.46					6.50
Means		0.84	0.96	1.09	1.15	1.45	(1.27)	(1.04)	(0.93)	(0.80)	
Departures		+0.16	+0.21	+0.21	+0.11	+0.13	+0.22	+0.20	+0.21	+0.14	

[1] Extrapolated.

TABLE 1.—*Solar radiation intensities during September, 1924*—Con.

Madison, Wis.

Date	Sun's zenith distance										
	Sa.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass									Local mean solar time
		A. M.					P. M.				
	e	5.0	4.0	3.0	2.0	[1]1.0	2.0	3.0	4.0	5.0	e
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Sept. 2	8.81			1.13	1.28	1.48					7.57
3	7.57			1.06	1.24						9.14
5	7.29			1.16	1.33	1.50					5.56
9	6.27		1.06	1.21	1.33	1.51	1.34				6.27
17	8.81					1.38					9.14
22	6.02		1.05	1.15	1.30	1.46	1.28				6.50
23	7.57			1.05	1.31	1.45	1.24	1.06	0.90		6.02
25	7.87						1.01				10.59
29	5.16			1.12	1.32						4.95
30	4.75		1.14	1.26	1.38	1.49	1.36	1.21			4.57
Means			1.08	1.14	1.31	1.47	1.25	(1.14)	(0.90)		
Departures			+0.16	+0.10	+0.13	+0.08	+0.06	+0.12	+0.04		

Lincoln, Nebr.

Sept. 2	7.57	0.66	0.87	0.99	1.12	1.43	1.23	1.01	0.85	0.76	7.57
3	7.87	0.83	0.93	1.06	1.22	1.40	1.17				9.14
4	9.83	0.61	0.70	0.82	1.08	1.33	1.19	1.04	0.92	0.82	14.10
5	7.87		0.89	0.98	1.25	1.47	1.14	0.93	0.76	0.62	6.50
8	8.48						1.19	1.05	0.90	0.80	9.47
12	7.29			1.09	1.28	1.49					7.87
22	5.79			1.07	1.29	1.53	1.22	0.98	0.77		4.57
23	6.50		1.04	1.17	1.30	1.49					5.36
24	8.18		1.02	1.13	1.29	1.44	1.21	1.01	0.86	0.74	7.04
25	8.81		0.76	0.87	1.01	1.16	1.41				9.14
29	4.17						1.30	1.18	1.06	0.93	4.17
30	4.95	0.93	1.02	1.15	1.30	1.45	1.22	1.04	0.88	0.76	4.95
Means		0.76	0.92	1.05	1.23	1.44	1.21	1.03	0.88	0.78	
Departures		+0.01	+0.06	+0.04	+0.04	+0.04	+0.05	+0.05	+0.05	+0.05	

TABLE 2.—*Solar and sky radiation received on a horizontal surface*

[Gram-calories per square centimeter of horizontal surface]

Week beginning—	Average daily radiation					Average daily departure from normal		
	Washington	Madison	Lincoln	Chicago	New York	Washington	Madison	Lincoln
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Sept. 3	454	366	515	300	356	+62	−10	+78
10	375	271	295	238	321	+2	−78	−116
17	206	322	334	338	276	−154	−5	−56
24	243	320	415	277	280	−104	+15	+44
Excess or deficiency since first of year on Sept. 30, 1924						−248	−7984	+2665

CORRECTION

REVIEW, August, 1924, page 400: In Table 1, Washington, the means (next to bottom line) of the P. M. columns headed Air Mass 2.0, 3.0, and 4.0, given as 1.01, 0.88, and 0.73, respectively, *should be* 1.07, 0.96, and 0.82.